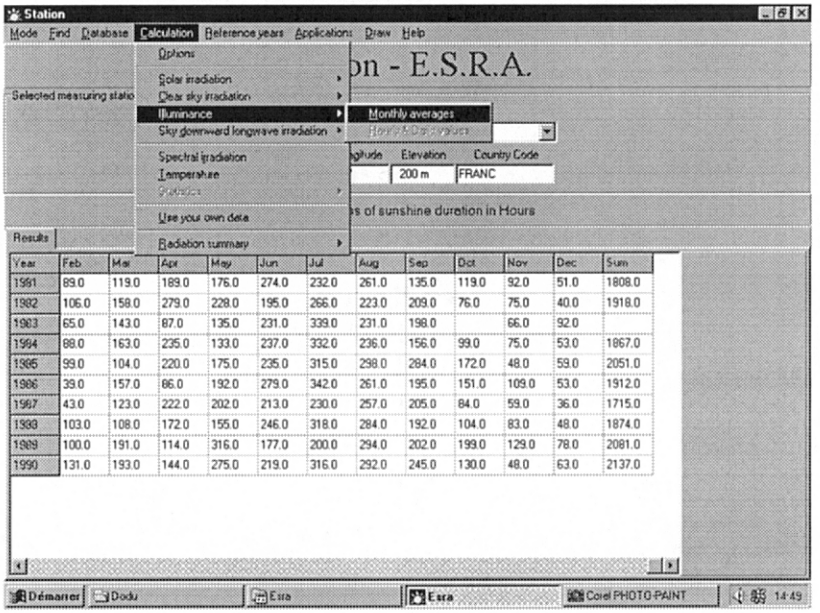
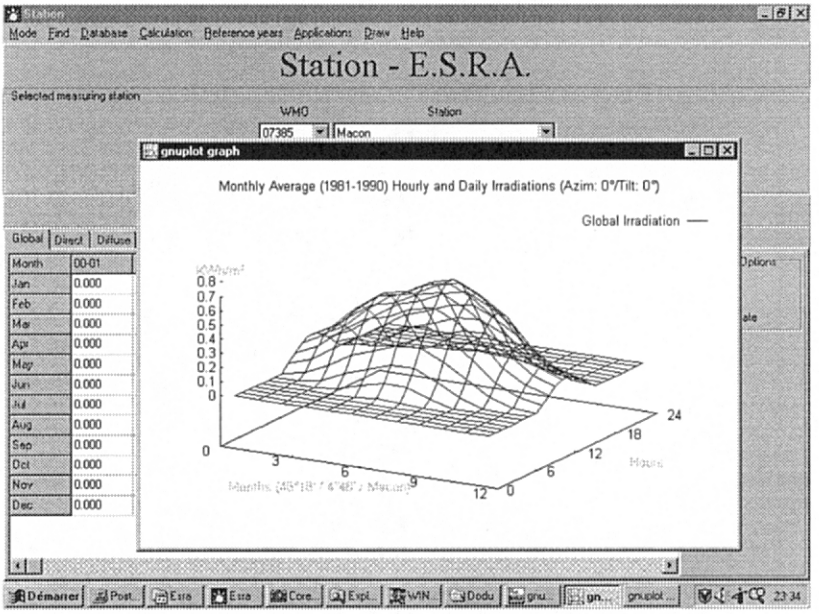
Options of the Calculation menu



The Draw menu allows to plot data



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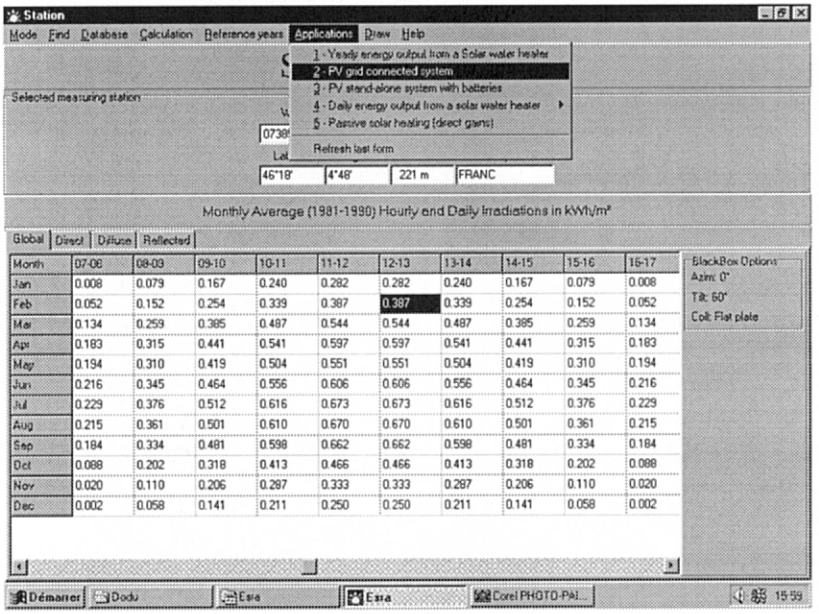
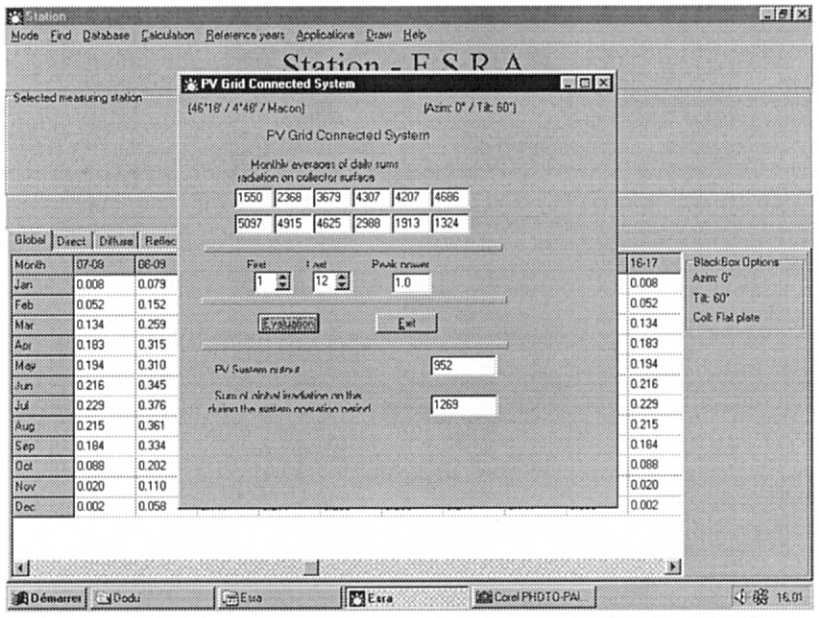
Options of the Application menu



PV grid connected system application



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3 year+ research project: January 1996 to March 1999

Objectives:

Make two years of half hourly data available (1996 and 1997)

Allow the user to:

look at variations over Europe

select a site in an easy way

define his own parameters/ his own statistics

Provide application examples (daylighting to start with...)

Expected use of the data

Design of daylighting systems

Design of solar controls

Design of solar collectors

Analysis of demand of electricity

Materials degradation

Agriculture

Marine biomass evolution...

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The SATELLIGHT official team

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L. Roche (Building Research Establishment, United Kingdom)

H.G. Beyer (University of Magdeburg, Germany)

L.Wald, C. Rigollier (Ecole des Mines de Paris, Sophia-Antipolis, France)

SATELLIGHT coverage of Europe

Meteosat image of
640 by 384 pixels:
a total of 241,913 pixels
(10 km by 10 km each)

48 Countries in Western
and Central Europe

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Computation of the global horizontal irradiance available on ground

Use of the clear sky index (Modified Heliosat method)

$$k_{cloudless} = \frac{Eeg}{Eeg_{cloudless}}$$

$n \leq -0.2 \quad k_{cloudless} = 1.2$

$n > -0.2 \;\&\; n \leq 0.8 \quad k_{cloudless} = 1 - n$

$n > 0.8 \;\&\; n \leq 1.1 \quad k_{cloudless} = 2.0667 - 3.6667n + 1.6667n^2$

$n > 1.1 \quad k_{cloudless} = 0.05$

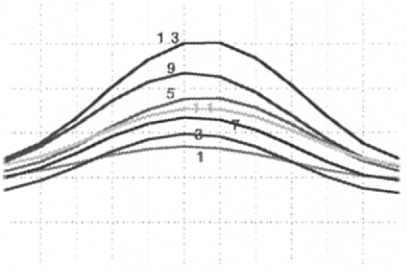
References: Heliosat (Cano, Beyer), Cloudless (Kasten, Dumortier)

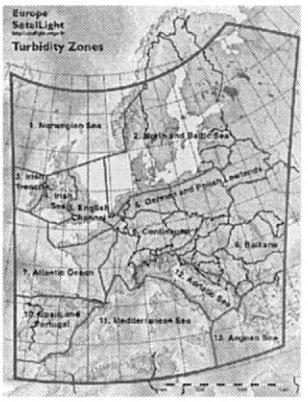
$k_{cloudless} = \frac{Eeg}{Eeg_{cloudless}}$

Monthly turbidity variations

Model based on monthly values from ESRA stations

13 zones of turbidity variations





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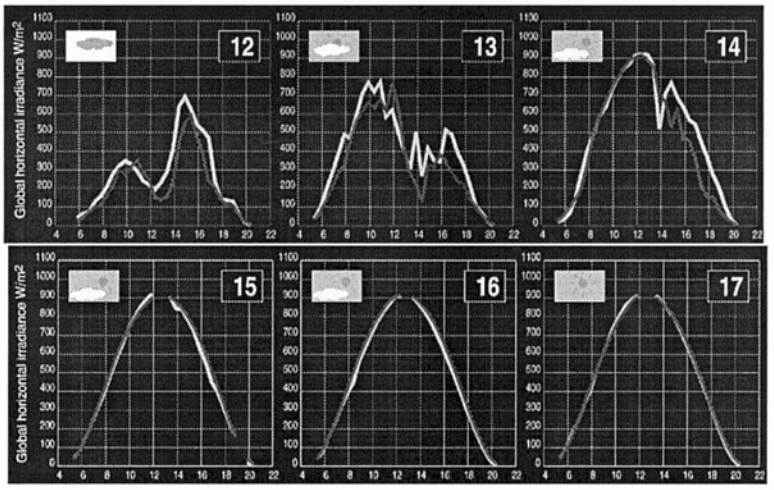
Comparison between global horizontal irradiance measured on ground and satellite estimates



Comparison between global horizontal irradiance measured on ground and satellite estimates

Gävle (Sweden)	mbe:-1%	rmse:26%
Nantes (France)	mbe:-1%	rmse:33%
Genève (Switzerland)	mbe:-2%	rmse:32%
Vaulx-en-Velin (France)	mbe:-1%	rmse:34%
Lisbon (Portugal)	mbe:-2%	rmse:21%

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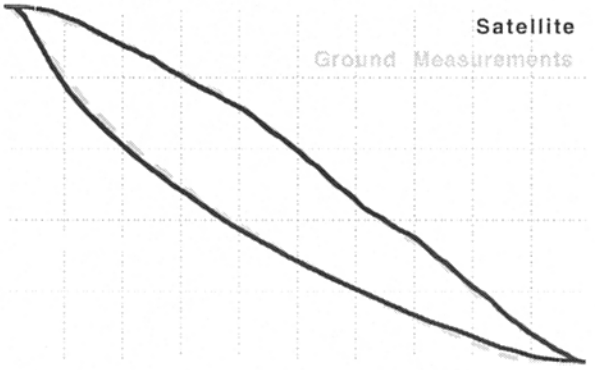
Comparison between global horizontal irradiance measured on ground and satellite estimates



Computation of the diffuse horizontal irradiance available on ground

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Computation of additional parameters

Based on global and diffuse horizontal irradiances

Illuminances *(Olseth/Skartveit luminous efficacy model)*

Irradiances and illuminances on tilted planes

(Hay model modified by Olseth and Skartveit)

Sky luminances *(Perez sky luminance model)*

The Web server development

D. Dumortier *(Coordination and development - ENTPE)*

C. Pinnédon *(Interface design)*

J. Clerc *(W3 server and Database development-NCTech)*

S. Monéger *(W3 server and Database development-NCTech)*

The server is developed entirely in Java, on a Sun

Workstation Ultra 10/300 with 40 Go storage capacity

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Web server database

Two years of cloud index values for 241,913 pixels

(computed from Meteosat images - PostGres SQL)

Preprocessed statistical results as maps

(to speed up map creation - Unix binary files)

An altitude database

(the average over a 5 ' by 5 ' area)

A database of 750,000 geographic names

(with latitude , longitude)

The server is still in development.

It will open officially on June 1, 1999

http://satellight.entpe.fr

Ready for a quick tour of the server !

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